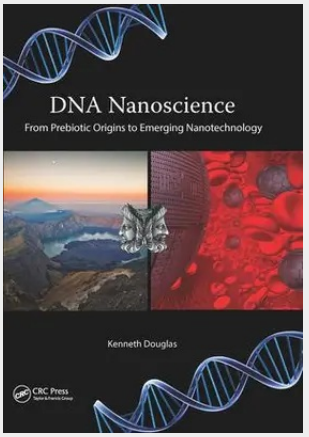
Douglas

DNA Nanoscience

From Prebiotic Origins to Emerging Nanotechnology

DNA Nanoscience: From Prebiotic Origins to Emerging Nanotechnology melds two tales of DNA. One is a look at the first 35 years of DNA nanotechnology to better appreciate what lies ahead in this emerging field. The other story looks back 4 billion years to the possible origins of DNA which are shrouded in mystery. The book is divided into three parts comprised of 15 chapters and two Brief Interludes. Part I includes subjects underpinning the book such as a primer on DNA, the broader discipline of nanoscience, and experimental tools used by the principals in the narrative. Part II examines the field of structural DNA nanotechnology, founded by biochemist/crystallographer Nadrian Seeman, that uses DNA as a construction material for nanoscale structures and devices, rather than as a genetic material. Part III looks at the work of physicists Noel Clark and Tommaso Bellini who found that short DNA (nanoDNA) forms liquid crystals that act as a structural gatekeeper, orchestrating a series of self-assembly processes using nanoDNA. This led to an explanation of the polymeric structure of DNA and of how life may have emerged from the prebiotic clutter.



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